MODELLING THE QUALITY OF HARUMANIS MANGO (MA 128) GRADING USING FUZZY LOGIC SYSTEM

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ABSTRACT

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One of the factors that determining the market values of fruit is the quality. Most of the fruits for export markets are firstly sorted and graded according to the size and appearance of the fruits. The factors that caused the grading of fruits to varies because of lack of expenditure in purchasing the grading machines, human error and well trained personnel. This research focus on the surface area of mango fruits, size of defect and number of defect presence on the mango skin. This study will grade of the Harumanis mango into various categories of classes such as grade A, B or C. This results which in to compare the accuracy of grading Harumanis fruit between manually system and Fuzzy Logic. The result of this study shows that modeling using Fuzzy logic will help to identify and forecast the input data to produce classification result which is of high accuracy. Through this process, the value of each element of input and output can be identify. These valuable data was inserted into Fuzzy Inference System (FIS) through Adaptive Neuro-Fuzzy Inference System (ANFIS). This method was the most suitable for forecasting the model data. The result shows that the classification result from the system achieved 85% accuracy. The grading system using these method can be applied to grade accurately varieties of fruits for domestic and export market.

ABSTRAK

MODEL KUALITI MANGGA HARUMANIS (MA128) DENGAN MENGGUNAKAN SISTEM TEKNIK KABUS

Salah satu faktor yang menentukan nilai pasaran buah-buahan adalah kualiti. Kebanyakan buah-buahan untuk pasaran eksport pertamanya disusun dan digredkan mengikut saiz dan luaran buah-buahan. Faktor-faktor yang menyebabkan penggredan buah-buahan berbeza kerana kekurangan perbelanjaan untuk membeli mesin penggredan, kesilapan manusia dan kakitangan terlatih. Kajian ini telah mengfokus kepada kawasan permukaan buah mangga , saiz kecacatan dan bilangan kecacatan pada kulit mangga. Kajian ini akan menggredkan mempelam Harumanis ke dalam pelbagai kategori kelas seperti gred A, B atau C. Ketepatan keputusan kajian ini akan dibuat perbandingan diantara menggred secara manual dan menggunakan teknik kabus. Keputusan kajian ini menunjukkan model yang menggunakan teknik kabus dapat membantu dalam mengenalpasti dan melakukan anggaran terhadap nilai kemasukan untuk menghasilkan keputusan dengan ketepatan yang tinggi. Menerusi proses ini, nilai setiap unsur kemasukan dan pengeluaran boleh dikenalpasti. Data-data tersebut dimasukkan kedalam "Fuzzy Inference System (FIS)" melalui "Adaptive Neuro-Fuzzy Inference System (ANFIS)". Ini merupakan kaedah yang paling sesuai untuk melakukan anggaran data model. Keputusan kajian ini menunjukkan keputusan pengelasan menerusi sistem ini boleh mencapai sehingga 85 peratus ketepatan. Sistem penggredan dengan menggunakan kaedah ini boleh diaplikasikan untuk menggred pelbagai jenis buah-buahan secara tepat untuk kegunaan domestik dan pasaran ekspot.